Paper ID: 90322
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IAF BUSINESSES AND INNOVATION SYMPOSIUM (E6)
Innovation: The Academics' Perspectives (3)

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REGULATION AS A CATALYST FOR INNOVATION: A KEY TO SPACE SUSTAINABILITY?

Abstract

Increasing activity in space is leading growing issues of pollution on Earth and the proliferation of space debris. The challenges associated with long-term space sustainability are significant. This study is applying a historical perspective on industry challenges starting in the 1970s. As voices become louder and regulations are enacted on a variety of sustainability many Earth-based industries, it becomes clear that the space industry is on the edge of requiring a transition towards sustainable practices. Regulations can be seen as a critical driver for sustainable development and thus, enabler for space sustainability. Under this background, this paper presents exemplary cases of regulations as a mechanism to stimulate innovation. First, a literature review is conducted to understand the impact of regulations on innovation across a variety of industries. The findings set the foundation to examine existing and prospective regulations targeting space sustainability. Regulations are then assessed on whether they are barriers or drivers for innovation. The study combines the results and develops a structured overview of regulations that are known to drive technological progress and an operational transition, paralleling lessons from various industries with applications to the space industry. The research findings suggest that the space industry can apply learnings from other industries and proactively engage in sustainable innovation, focusing on the reuse of satellites and other space assets. The findings emphasize the potential of regulations as a catalyst for innovation targeting at achieving space sustainability. Moreover, this research can encourage industry stakeholders to adopt sustainable practices even in the absence of regulations. With this, the space industry can not only mitigate the risks associated with space debris but also unlock new opportunities for economic and technological growth within a sustainable framework and a circular space economy.